Physics 008 Laboratory Learning Mathematica

Weeks #1 - #3

Textbook: Mathematica Demystified by Jim Hoste

Save all of your work (including entering commands from textbook and solving exercises) in a Mathematica notebook.

As you learn this stuff in lab, I will ask you to use it in homework problems.

Get as far as you can each week in lab. It is most important to reach Chapter 6. Getting beyond that is not important unless you are not having any difficulties with earlier materials.

We will do all of Mathematica in more detail in Physics 50 lab. next spring.

Laboratory #1 - Readings BEFORE coming to lab: Chapter 1-3
Think about the exercises before coming to lab.

Chapter 1 - Getting Started

This is a quick introduction to basic command structure in Mathematica. You should have no trouble quickly going through this chapter in lab. You should enter and execute all the examples in the book.

Do exercises 1, 4, 7, 9

Chapter 2 - Two-Dimensional Graphics

This is an introduction to two-dimensional plotting in Mathematica. Skip section 2.12. Again this is very straightforward and you should have no trouble quickly going through this chapter in lab. You should enter and execute all the examples in the book.

Do exercises 1 - 7

Chapter 3 - Getting Help

Very straightforward introduction to help capabilities in Mathematica.

Laboratory #2 - Readings BEFORE coming to lab: Chapter 4-6
Think about the exercises before coming to lab.

Chapter 4 - Odds and Ends

In this chapter we will expand our knowledge of Matheamtica commands filling in various gaps.

Do exercises 3, 5, 8, 9

Chapter 5 - Functions

Very important stuff - we learn to define our own functions and do simple programming.

Do exercises 1, 3, 10

Chapter 6 - Three-Dimensional Graphics

This chapter is most important for visualizing in electricity and magnetism.

Do exercises 1-4, 10

Laboratory #3 - Readings BEFORE coming to lab: Chapter 7-9
Think about the exercises before coming to lab.

Chapter 7 - Calculus

Limits, Derivatives, Max/Min, Series and Integration - clearly this is very important stuff.

Do exercises 1, 2-3, 7, 8

Chapter 8 - Solving Equations

Solving all kinds of algebraic equations and a simple differential equation.

Do exercises 1, 3, 5, 6, 7-9